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09/684,122	10/06/2000	Mitsuru Tokuyama	55288(904)	3208

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EXAMINER	
EDWARDS, PATRICK L	
ART UNIT	**PAPER NUMBER**
2621	6

DATE MAILED: 11/20/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/684,122	TOKUYAMA ET AL.
	Examiner	Art Unit
	Patrick L Edwards	2621

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *3* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

1. Claims 1-21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With regard to claim 1, the metes and bounds of the word "kinds" are unclear. In addition, the metes and bounds of the phrase "upon area determination of the target pixel in an inputted image data" are unclear. Said phrase does not make sense in its current context.

With regard to claim 5, the metes and bounds of the word "kinds" are unclear.

With regard to claim 8, the metes and bounds of the term "dot mesh area" are unclear. This term is not well known in the art and requires a clear definition.

With regard to claim 16, the limitation that "all determination methods are executed in parallel" is recited. There is no antecedent basis for "determination methods" as recited in the claim. In addition, the claim goes on to recite the individual determination methods. There is also insufficient antecedent basis for the individual determination methods as recited in the claim.

With regard to claims 18-20, these claims do not further limit the subject matter of the claim that they depend on.

Claims 2-4, 6, 7, 9-15 and 17 are rejected because they are dependent on indefinite claims.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –

> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

3. Claim 1 is rejected under 35 U.S.C. 102(e) as being anticipated by Sacks (6,111,975). Sacks discloses an image processing device for computing a total density for four sub pixel groups provided in a main pixel group, which is constituted by a plurality of pixels including a target pixel (column 3 lines 36-46 and column 4 lines 46-63 in conjunction with Figure 1(a-e)). The linear sub-arrays disclosed in Sacks are analogous to the sub pixel groups as recited in the claim. The computation of the anti-median values for the four sub-arrays as disclosed in Sacks is analogous to a computation of the total density for the sub pixel groups as recited in the claim. These operations are analogous because it is necessary to compute a density value for all the pixels in the sub-array in order to determine the anti-median value. As a result, we can conclude that computing a total density for a given sub-array is inherent in computing its anti-median value. Figure 1(a) shows a main pixel group and a target pixel from that group. Sacks further discloses making area determinations based on the anti-median values of the four sub-arrays (column 6 lines 30-33).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 2, 10, 11 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sacks in view of Kanata (US Patent 6,473,202). The arguments as to the relevance of Sacks as applied to claim 1 in paragraph 3 above are incorporated herein.

With regard to claim 2, Kanata discloses an area determination that determines whether or not a target pixel is an edge area (Kanata column 7 lines 28-58). It would have been obvious to one reasonably skilled in the art at the time of the invention to combine the edge determination method as taught by Kanata with Sacks method of area determination by using a main pixel group comprised of sub-pixel groups. Such a modification would have allowed for a method of edge determination that determined whether or not a target pixel of a main block of pixels was an edge area by computing the sub-pixel groups in the main pixel group. This would have allowed for an efficient method of edge determination.

With regard to claim 10, Kanata further discloses computing the average density of a main pixel group and the result is used to determine whether or not the target area is an edge area (Kanata column 5 lines 49-51). The average density calculation disclosed in Kanata is performed by the color determining unit (Kanata element 105 of Figures 1 and 2). The edge determining unit then uses the output from the color determining unit to determine whether or not the target pixel is an edge area (Kanata column 7 lines 29-36). It would have been obvious to one reasonably skilled in the art at the time of the invention to combine the edge determination method as taught by Kanata with Sacks method of determining area by using a main pixel group comprised of sub-pixel groups. Such a modification would have allowed for a method of edge determination that used an average density calculation for the main pixel group to help determine whether or not the target pixel was an edge area. This would have allowed for the use of an additional parameter to be used in edge determination and consequently would have made for more accurate edge determination.

With regard to claim 11, the combination of Sacks and Kanata fails to expressly disclose that the average density is not computed by dividing a total density of the main group of pixels by the number of

pixels in the group, but rather by dividing the total density by the power of 2 closest to the number of pixels in the group. It is well known in the art, however, that dividing by a power of 2 only a bit shift operation, whereas dividing by a number other than a power of two requires additional computations. As a result, it would have been obvious to apply this division system to the computation of average density for a group of pixels in order to decrease the required number of operations and thereby increase efficiency.

With regard to claim 13, Kanata further discloses performing a plurality of determining operations in a predetermined order (Kanata column 5 lines 24-35). It would have been obvious to one reasonably skilled in the art at the time of the invention to combine the multiple operation edge determination method as taught by Kanata with Sacks method of area determination by using a main pixel group comprised of sub-pixel groups. Such a modification would have allowed for a method of edge determination that utilized a number of different parameters and consequently improved edge determination accuracy.

6. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sacks in view of Adachi (US Patent 6,111,982). The arguments as to the relevance of Sacks as applied to claim 1 in paragraph 3 are incorporated herein. Adachi discloses normalizing a group of pixels that has a different number of pixels in the main scanning direction and the sub scanning direction (Adachi column 8 lines 2-6). This operation is analogous to performing normalization when sub-pixel groups differ in size because the sub-pixel groups as recited in the claim are disposed in the main scanning direction and the sub scanning direction. It would have been obvious to one reasonably skilled in the art at the time of the invention to combine the normalization of a non-square mask as taught by Adachi with Sacks method of area determination by using a main pixel group comprised of sub-pixel groups. Such a modification would have allowed for an area determination system that could use a mask that differed in size in the main and

sub-scanning directions. This would have allowed for a system that could function with a small number of line buffers and consequently the system would be more cost efficient because less memory is required.

7. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sacks in view of Murakami (US Patent 5,982,946). The arguments as to the relevance of Sacks as applied to claim 1 in paragraph 3 above are incorporated herein. Sacks discloses four kinds of sub-pixel groups within a main pixel group, but fails to expressly disclose that said sub-pixel groups are disposed around an end of the main pixel group. Murakami, however, discloses a pixel block comprised of four groups of sub-pixels that are disposed about the ends of the pixel block and form the rectangular frame that is the pixel block (Murakami column 4 lines 29-45).

It would have been obvious to one reasonably skilled in the art at the time of the invention to combine the main pixel group that has sub-pixel groups disposed around the ends of it as taught by Murakami with Sacks method of determining the area of a target pixel by using a main pixel group comprised of four sub-pixel groups. Such a modification would have allowed for a rectangular main pixel group that had the sub-pixel groups as far away as possible from the target pixel in the main pixel group. This would have allowed for sub-pixel group density difference calculations that were effective in determining the area that the target pixel belonged to.

8. Claims 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sacks in view of Kobayashi (US Patent 6,052,484). The arguments as to the relevance of Sacks as applied to claim 1 in paragraph 3 above are incorporated herein.

With regard to claim 5, Sacks fails to disclose that the density differences between two groups of pixels are added together to compute a value to be used in area determination. Kobayashi discloses

adding the density differences of two groups of pixels and using the result of said summation to make an area determination (Kobayashi column 4 lines 31-41). The pixels adjoining in the main scanning direction and the pixels adjoining in the sub-scanning direction as disclosed in Kobayashi are analogous to two groups of pixels as recited in the claim. It would have been obvious to one reasonably skilled in the art at the time of the invention to combine the computation of an area determination parameter by adding density differences of two groups of pixels as taught by Kobayashi with Sacks method of area determination by using a main pixel group comprised of sub-pixel groups. Such a modification would have allowed for an area determination system that utilized an area determination parameter produced from density differences in groups of pixels. Adding such an area determination parameter would have made for a more robust and precise area determination system.

9. Claims 6-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Sacks and Kobayashi as applied to claim 5 and further in view of Adachi (6,111,982). The arguments as to the relevance of the combination of Sacks and Kobayashi as applied to claim 5 in paragraph 8 above are incorporated herein.

With regard to claim 6, Adachi discloses summing density difference between adjacent pixels in a main scanning direction and summing density differences between adjacent pixels in a sub-scanning direction (Adachi column 7 lines 57-65). It would have been obvious to one reasonably skilled in the art at the time of the invention to combine the computation of the summation of density difference values between adjacent pixels in the main and sub scanning directions as taught by Adachi with the area determination system disclosed in the combination of Sacks and Kobayashi. Such a modification would have allowed for an additional area determination parameter to be added to the area determination system in order to provide for a more accurate and robust area determination method.

With regard to claim 7, Adachi further discloses determining a difference between density differences in a main scanning direction and a sub-scanning direction (Adachi column 3 line 66 – column 4 line 3).

With regard to claim 8, Kobayashi further discloses the addition of the sum of density difference values in the main scanning direction with the sum of density difference values in the sub-scanning direction (Kobayashi column 6 lines 28-31).

With regard to claim 9, it is further limited that the density differences in the main scanning direction are between every other pixel. It would have been an obvious matter of design choice to modify the complication degree determination method in the main scanning direction by computing the density differences between every other pixel, rather than adjacent pixels. Since the applicant has not disclosed that computing the density differences between every other pixel solves any stated problem, it appears that the complication degree in the main scanning direction would be an equally effective area determination parameter if density differences were computed between adjacent pixels.

10(a). Claims 14 and 15 are rejected under 35 U.S.C 103(a) as being unpatentable over the combination of Sacks in view of Kanata as applied to claim 13 and further in view of Adachi and Kobayashi. The arguments as to the relevance of the combination of Sacks, Kanata, Adachi and Kobayashi as applied in paragraph 9 is incorporated herein

With regard to claim 15, which is representative of claim 14, the applicant further limits the area determination by specifying the order that the different area determination parameters are applied in order to make an area determination for a target pixel. It would have been an obvious matter of design choice to modify the area determination system comprised of a plurality of area determination parameters by specifying the order that these parameters are applied. Since the applicant has not disclosed that this

specific order of execution solves any stated problem, it appears that the area determination system would be equally effective if the area determination parameters were applied in a different order.

10. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Sacks and Kanata as applied to claim 2 above, and further in view of Fujita (US Patent 5,659,402). The arguments as to the relevance of the combination of Sacks and Kanata as applied to claim 2 in paragraph 5 above are incorporated herein. Said combination fails to expressly disclose changing the threshold for determining an edge area.

Fujita, however, discloses a threshold value that changes after a number of area determinations have been made (column 6 lines 60-63). It would have been obvious to one reasonably skilled in the art at the time of the invention to combine the dynamic edge area determination threshold as taught by Fujita with the edge determination method disclosed in the combination of Sacks and Kanata. Such a modification would have allowed for a flexible edge determination method that could successfully determine edge and non-edge areas regardless of the image type.

11. Claims 16-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sacks in view of Fujita (US Patent 5,659,402). The arguments as to the relevance of Sacks as applied to claim 1 in paragraph 3 are incorporated herein.

With regard to claim 16, Fujita discloses that the area determination methods are executed in parallel (Fujita column 19 lines 64-67). The individual determination methods recited in the claim do not have antecedent basis (see paragraph 1) and consequently the relevant arguments with respect to said determination methods will be given when referring to the claims that describe the methods. It would have been obvious to one reasonably skilled in the art at the time of the invention to combine the parallel

execution of determination methods as taught by Fujita with Sacks method of determining area by using a main pixel group comprised of sub-pixel groups. Such a modification would have allowed for the area determination parameters to be computed more efficiently and consequently produce a faster method of area determination (Fujita column 19 lines 66-67).

With regard to claim 17, the further limitation that the area determination is made using a truth table is recited. A truth table is well known in the art as a table that determines outputs based on the value of the inputs. Fujita discloses determining the value of the output pixel based on the values of already computed determining parameters with respect to a plurality of threshold values (Fujita column 21 lines 6-36). As a result, we can conclude that Fujita discloses an operation analogous to using a truth table in order to make area determinations. The difference between these two operations lies solely in nomenclature.

With regard to claim 18, Fujita discloses changing a filter processing coefficient based on the area determined in the area determination method (Fujita column 19 lines 47-60). Fujita discloses selecting the proper filter processing operation on the basis of the area determination. The process of selecting the proper filtering processing operation as disclosed in Fujita is analogous to changing a filter processing coefficient as recited in the claim. The operations are analogous in that they both change the level of filtering on the basis of area determination. It would have been obvious to one reasonably skilled in the art at the time of the invention to combine the modification of the filter processing coefficient on the basis of area determination as taught by Fujita with Sacks method of determining area by using a main pixel group comprised of sub-pixel groups. Such a modification would have allowed for proper filtering of all pixels in an image, regardless of what area the pixels belonged in (Fujita column 19 lines 55-58).

With regard to claims 19 and 20, it is further limited that a gamma correction table and an error diffusion parameter are corrected based on an area determination. Gamma correction and error diffusion are both methods for correcting an image that are well known in the art. Filter processing is also a

method for correcting that is well known in the art. Fujita discloses changing a filter processing coefficient on the basis of area determination, but does not expressly recite changing gamma correction tables or error diffusion parameters on the basis of area determination. However, it would have been obvious to apply Fujita's method of changing the parameters of an image correction method after area determination to two other well known in the art image correction methods. Such a modification would have allowed for proper correction of all pixels in the image, regardless of what area the pixels belong in (Fujita column 19 lines 55-58) or what specific type of correction is being applied to the pixel.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patrick L Edwards whose telephone number is (703) 305-6301. The examiner can normally be reached on 8:30am - 5:00pm M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo Boudreau can be reached on (703) 305-4706. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

Patrick Lynn Edwards

Art Unit 2621

ple

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